

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

HEAVY USE AREA PROTECTION

(Acre)

CODE 561

DEFINITION

Protecting heavily used areas by establishing vegetative cover, by surfacing with suitable materials, or by installing needed structures. This standard does not apply to Access Roads (560) or Livestock Heavy Use Area Protection (757i).

PURPOSE

This practice may be used as a part of a conservation management system to support one or more of the following resource concerns.

- Reduce soil erosion
- Improve water quantity and quality
- Improve air quality
- Improve aesthetics

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to urban, agricultural, recreational or other frequently and intensively used areas requiring treatment to address one or more resource concerns.

CRITERIA

All planned work shall comply with Federal, State, and local laws and regulations.

Drainage and Erosion Control. Provisions shall be made for surface and subsurface drainage as needed, and for disposal of runoff without erosion. Drainage provisions need to consider diversion of runoff up slope of the facility, grading to prevent ponding and erosive velocities on the improved surface, and increased down slope runoff resulting from surfacing.

Vehicular Loading. Areas subject to automotive traffic shall be surface treated for a designed minimum wheel load of 4,000 lb. Areas subjected to frequent heavy truck traffic must be designed for the appropriate wheel loading.

Non-Vehicular Usage. Areas subject to intensive human usage shall be permanently vegetated or surfaced. Surface treatment shall be placed on a stable base, and be a minimum of two inches thick unless stated otherwise in the applicable surface treatment section.

Foundation. All site foundations shall be evaluated for soil moisture, permeability, texture and bearing strength in combination with the design load and anticipated frequency of use.

A base course of gravel, crushed stone, other suitable material and/or geotextile shall be provided on all sites with a need for increased load bearing strength, drainage, separation of material and soil reinforcement

An impervious barrier shall be provided on sites with a porous foundation (high permeability rate), where there is a need to protect ground water from contamination.

Foundation preparation shall consist of removal and disposal of soil and other material that are not adequate to support the design loads.

Section IV, FOTG Standard 561

Surface Treatment

Aggregate. Aggregate treatment designed for vehicular loading consists of geotextile fabric overlain with crushed aggregate base material, overlain with surface material.

The following table can be used to configure aggregate heavy use area protection areas with optional base and surface materials:

Aggregate Material Configurations (minimum finished compacted thickness)			
Crushed Aggregate Material	Option		
	A	B	C
<u>1</u> / AASHTO M 43 # 1 or 2	6"	4"	
AASHTO M 43 # 57or 67	2"		
<u>2</u> / ODOT 304.02 or 411.02		4"	8"

1/ The voids between the stone are to be choked with fines (57s', 67s', 304s' or 411s') to create a smooth surface.

2/ Compaction is required for materials containing fines (e.g. 304's & 311's). Compact by tracking the entire surface with a minimum of 4 passes of a drum roller, or vibratory drum roller. Rubber tired equipment having a 4000 lb minimum wheel load may be used when the entire surface can be uniformly tracked. Addition of water may be necessary to obtain maximum compaction. The moisture content should be sufficient that a hand held ball can be formed, and material will stain the hands.

Geotextile Fabric Minimum Average Roll Values (MARV):

- Minimum tensile strength (ASTM D 4632) – 120 lb
- Elongation at failure (ASTM D 4632) -- < 50% for woven; ≥ 50% for non-woven
- Minimum burst strength (ASTM D 3786) – 210 psi
- Minimum puncture strength (ASTM D 4833) – 60 lb
- Apparent opening size (ASTM D 4751)
≤ # 40 U.S. Standard Sieve (AOS) ≥ # 100 U.S. Standard Sieve (≤0.42mm (AOS) ≥ 0.149mm)
- Permittivity (ASTM D 4491) ≥ 0.03 sec⁻¹ , ≤ 0.70 sec⁻¹
- Minimum ultraviolet light protection (% residual tensile strength, ASTM D4355) – 70%

Non woven geotextile is preferred over woven geotextile for this application because of improved drainage and less tendency for the granular material to slide on the geotextile surface during construction.

Aggregate surfacing, including the base, for non vehicular areas consists of a two inch minimum thickness of crushed aggregate as shown above. The surface may be topped with an additional two-inch thickness of screenings for a more desirable walking surface. Geotextile underlayment is optional, but should be used when a wet subgrade is anticipated during usage.

Asphalt. Areas planned for asphalt surfacing shall have a 6-inch minimum base of crushed aggregate or other approved material. Thickness of the asphalt course, the kind and size of aggregate, type of proportioning of bituminous materials, and the mixing and placing of these materials shall be in accordance with good highway practice for the expected loading.

Concrete. Design slabs considering the required performance and the critical applied loads. The subgrade material must be evaluated as to the suitability and denseness. A 4-inch thick layer of crushed gravel or limestone shall be provided as a uniform subbase. Where the subgrade is uniform and dense, a Type S-1 concrete slab is acceptable. Type S-2 concrete slabs shall be used where the subgrade material is non-uniform or has variable density, and it is not economical or feasible to improve the subgrade. The subgrade thickness in question is generally 12 inches, but could be more, depending on the soil profile. Design Criteria for Type S-1 and S-2 concrete slabs is found in the NRCS Concrete Construction specification (210-VI-EFH, Amend OH-17, February 14, 2000).

Concrete placed for non-vehicular usage (such as sidewalks) shall have a minimum thickness of 3½ inches.

Other Cementitious Materials. Soil cement, roller compacted concrete, and coal combustion by-products (flue gas desulfurization (FGD) and fly ash, if approved by the Ohio EPA) may be used as surface material. The base and surface material shall be designed and installed to withstand the anticipated loads and surface abrasion.

Other. Where other surfacing materials are used, such as cinders, tanbark, sawdust, etc., the minimum base thickness shall be 6-inches, and the minimum surfacing thickness shall be 2-inches. Organic surfacing materials are not to be used when the primary design function is vehicular loading.

Structures

All structures shall be designed in accordance with appropriate NRCS standards and specifications or Engineering Handbook procedures.

Sprays and Artificial Mulches

Sprays of asphalt, oil, plastic, manufactured mulches and similar materials will be installed in accordance with the manufacturer's recommendations.

Vegetative Measures

Liming, fertilizing, seeding and will follow the recommendations in Section IV, FOTG Appendix A as appropriate for the intended purpose of the vegetated area. Sodding and vegetative establishment in highly erodible areas will follow Conservation Practice Standard 342, Critical Area Planting.

If vegetative treatment is not appropriate, structural or bio-engineering measures will be used to control erosion.

Safety

Necessary safety features, considering the intended use and site topography, will be included in the plan.

Additional Criteria for Areas Utilized for Recreation

The treated area shall be conducive to the overall recreation area and aesthetically blend with the general landscape and surroundings.

Plants, landscaping timbers, traffic control measures, wooden walkways, etc. shall be evaluated for effectiveness, aesthetics and accessibility as covered by the Americans with Disabilities Act.

Section IV, FOTG Standard 561

CONSIDERATIONS

When stabilizing heavily used areas consider adjoining land uses and the proximity to residences, utilities, cultural resource areas, wetlands or other environmentally sensitive areas, and areas of special scenic value.

For heavy use areas conducive to protection by vegetation, consideration must be given to the effect(s) of treading and/or miring. The vegetative species selected should tolerate and persist under heavy use conditions. If practicable, consider increasing the size of the area and/or establishing a rest/non-use period to allow plant recovery and increase vigor.

Heavy use area protection effects on the water budget, especially on volumes and rates of runoff, infiltration, and transpiration due to the installation of less pervious surfaces should be considered in the selection of surfacing materials.

The transport of sediments, oils and chemicals associated with vehicular traffic, and soluble and sediment-attached substances carried by runoff should be considered in selection of companion conservation practices.

If the purpose of the heavy use area protection is improvement of water quality, the heavy use area should be (re)located as far away from the waterbody or watercourse as possible. Any work in and/or discharges near streams, wetlands or waterbodies may require a permit from the US Army Corps of Engineers, state water quality (permitting) authority, or local authority.

Screenings consisting of # 10 crushed stone and smaller particles may be used as wear surface for pedestrian traffic. This material is easily tracked into buildings and vehicles when wet. Concrete or asphalt pavement should be used as an alternate surfacing material when cleanliness is a consideration.

PLANS AND SPECIFICATIONS

Plans and specifications for heavy use area protection shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Plans and specifications shall include construction plans, drawings, job sheets or other similar documents. These documents shall specify the requirements for installing the practice, including the kind, amount and quality of materials to be used.

OPERATION & MAINTENANCE

An Operation and Maintenance (O&M) plan shall be prepared for and reviewed with the landowner or operator. The plan shall specify that the treated areas and associated practices are inspected annually and after significant storm events to identify repair and maintenance needs.

The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.